

POWER OF TORPEDOES.

WHAT MODERN SHIPS OF WAR HAVE TO DREAD.

When the First Device of This Nature Appeared—How It Has Grown in Ability to Destroy—The Variety Adopted by the United States Government.

A Formidable Assailant.

During our war of independence, says a New York correspondent, David Bushnell, the father of American submarine warfare, threatened the British war vessels in New York harbor with torpedoes carried in a turtle-shaped boat that glided to the attack beneath the surface of the water.

At that time reliable insulated cable was not manufactured in the United States, and the electrical apparatus had for some years to be purchased in Europe, while special plants had to be established for the fabrication of the steel cases and connections. As the work advanced it was found that certain general conditions must be fulfilled.

The torpedo cases should be light, easily handled, and sufficiently buoyant to support the charge, mooring rope, and electric cable in a sensibly vertical position against the depressing effects of swift currents, or the torpedoes will sink below the touch of passing vessels; and the mechanical arrangements should be capable of resisting the shock from the explosion of neighboring mines. The

placed in circuit with the electric system through electric primers and insulated wires extended to the operating station, any effort to raise a mine or cut a cable will at once automatically draw a volley that would disable or greatly harass the boats.

In the absence of high-power guns an ironclad will move steadily forward and attempt by countermine to open a safe passage for a beleaguering fleet, and here the adopted Sims-Edison electric fish torpedo would prove a valuable auxiliary to the defense. The range of this aggressive torpedo is over two miles, while its speed exceeds eighteen miles an hour. It is steered, propelled, and exploded by means of a controllable electric current, and carries a charge capable of disabling the most formidable ironclad.

The complete torpedo consists of two distinct parts, the float and the hull. The former is filled with an unobstructible material and is practically indifferent to the bullets of rapid-firing guns; the latter, a cigar-shaped hull sheltered from fire under seven feet of water, carries in the bow section the explosive, in another an insulated cable, which pays out without strain as the torpedo proceeds, and in the stern section the electro-motor that revolves the propeller and a powerful relay that actuates the steering gear.

The electric current, produced by a dynamo on shore, and conveyed to the torpedo through the cable, is under control of the operator through the keyboard switches by which he can at will start, stop, steer to port or starboard, or explode the charge.

Movable torpedoes of this type will prove formidable assailants to the enemy's vessels moving cautiously in obstructed channels, and will re-enforce the fire of the mortars.

Ignorance of the nature and object of torpedoes has led the public to believe that harbors can, in an emergency, be protected by this branch of the defense alone. Heavy batteries and submarine mines are but correlative terms of a good defense. The function of the latter is to so obstruct the channels that the enemy's vessels shall be held under fire of the former. But at least it can be said that we have ready for duty a perfected defensive torpedo system, supplemented with a skilled corps of submarine miners and electricians.

Roquefort and Its Cheese.

Cheese, which has been the fortune of Roquefort, has destroyed its picturesqueness. It has brought speculators there who have raised great, ugly, square buildings of dazzling whiteness, in harsh contrast with the character and somber tone of the old houses. Although the place is so small that it consists of only one street and a few alleys, the more ancient dwellings are remarkable for their height. It is surprising to see in a village lost among the sterile hills houses three stories high. The fact that there is only a ledge on which to build must be the explanation. What is most curious in the place is the cellars. Before the cheese became an important article of commerce, these were natural caverns, such as are everywhere to be found in this calcareous formation; but now they are really cellars that have been excavated to such a depth in the rock that they are to be seen in as many as five stages, where long rows of cheese are stacked one over the other. The virtue of these cellars from the cheese-making point of view is their dryness, and their scarcely varying temperature of about 8° C., summer and winter.

But the demand for Roquefort cheese has become so great that trickery now plays a part in the ripening process. The peasants have learned that "time is money," and they have found that bread crumbs mixed with the curd causes those green streaks of moldiness, which denote that the cheese is fit for the market, to appear much more readily than was formerly the case, when it was left to do the best it could for itself with the aid of a subterranean atmosphere. This is not exactly cheating; it is commercial enterprise, the result of competition and other circumstances too strong for poor human nature. In cheese-making, bread crumbs are found to be a cheap substitute for time; and it is said that those who have taken to beer brewing in this region have found that box, which here is the commonest of shrubs, is a cheap substitute for hops. The notion that brass pins are stuck into Roquefort cheese to make it turn green is founded on fiction.—Temple Bar.

Origin of the God Hymen.

Danchet, the French poet, tells us, respecting the dedication of Hymen, that he was a young man of Athens, obscurely born, but extremely handsome. Falling in love with a young lady of distinction, he disguised himself in a female habit, in order to get access to her and enjoy the pleasure of her company. As he happened to be one day in this disguise with his mistress and her female companions, celebrating on the seashore the rites of Ceres Eleusina, a gang of pirates came upon them by surprise and carried them all off. The pirates, having conveyed them to a distant island, got drunk for joy and fell asleep. Hymen seized his opportunity, armed the virgins, and dispatched the pirates; after which, leaving the ladies on the island, he went in haste to Athens, where he told his adventure to all the parents, and demanded her for his bride in marriage, as a ransom. His request was granted, and so Hymen was the marriage that the name of Hymen was ever afterwards invoked on all happy nuptials, and in progress of time the Greeks named him among their gods.

The fact was, however, in the thing that can give you points.—Puck.

USES OF FLOUR BARRELS.

Some of the Pretty and Practical Things That Can Be Made From Them.

You think you are familiar with the possibilities of old barrels. You know how to make chairs of them. You have improved vastly on the rather primitive affair your ingenious grandmother was proud of having fashioned out of a barrel.

Did it ever occur to you that there are other possibilities in an empty barrel? Have you ever tried making a table of one? Four nicely curved staves will make the legs. Use the head of the barrel for the top, or, if you like, buy a piece of wood any size or shape you fancy. Get a square piece of timber a few inches long and about five and a half inches square. Take off the corners for about an inch, making an irregular octagon, and fasten on the sides the four barrel staves, with the ends well squared and smoothed off. Between them, where the corners were, fasten on some brackets to support the top.



THE POSSIBILITIES OF A BARREL.

A small hoop placed between the staves near the floor will make them more firm, and a coat of paint or varnish will complete quite a presentable little table.

A kind of round cabinet table can also be made by sawing out zigzag panels in the sides above the lower hoops and inserting a round shelf inside at this level. Put a round cover on the top and paint it white, first filling the cracks and imperfections with putty and rubbing down with sandpaper.

The cabinet of shelves is built of well-selected barrel heads, whose parts are held together by a broad cleat nailed on the under side of each head. These are supported by four upright pieces, with grooves sawed in the edges at different levels. Brackets strengthen the frame and secure the shelves properly. The edge is finished with a fringe or some other ornamental decoration about three inches deep.

A useful stand may be made of a barrel sawed in half lengthwise and resting upon a framework of plain boards with a shelf below. This may be filled with earth for a winter window garden or may have a cover hinged on for a table and be draped with a cloth to hide the barrel shape, which affords a spacious receptacle.

Still another may consist of two ends of a barrel with the heads in each part being sawed off just at the second hoop. Through four holes in the lower one run the supports of the frame and let the top part rest upon their ends. Some small brackets under each barrel head will strengthen the whole. Covered and decorated with cloth and plush and with cushioned sides and pockets, this makes a very convenient work table, or, decorated in rustic fashion, a very pretty plant stand.

Purification of Sewage.

The Engineering Record quotes the reported results of investigations made by officers of the Hygienic Institute of Munich upon the growth of certain plants in the River Isar as indicative of the process of self-purification in that stream in its downward flow after receiving the sewage of Munich. Prof. Von Pettenkofer, the chief of the bureau, believes that in running streams a moderate quantity of human excreta is decomposed and rendered harmless in the course of a few miles of flow. He supposes this does not depend on mere dilution or subsidence, but on the velocity of the stream, and particularly on the presence of free oxygen in the water, this being connected with the action of green algae and other water plants. Observation shows that a peculiar form of vegetable life, sometimes called the sewage fungus, grows luxuriantly about a mile below the point where the sewage enters the Isar, abounds seven miles lower down, and disappears farther off. The inference is that after about twelve miles of flow the turbulent stream is so far purified from nitrogenous organic matter that it no longer contains enough of it to support the growth of the sewage fungus. Also it has been found that at the mouth of the sewer the cubic centimeter of fluid contained 198,000 bacteria, while twenty miles lower the number had diminished to 3,602, and a mere trace a few miles farther. But the purification here referred to applies only to residential sewage, that is, to water fouled with human excreta, and not to that fouled with industrial waste products of various kinds of manufacture, many of which are directly poisonous to both animal and vegetable life in water. It is objected by another writer that probably the purification produced by algae is insignificant compared with that due to aerobic bacteria, protozoa, and other forms of animal and plant life. He holds that the importance of the presence of oxygen is undoubted, but that its influence on the organic matter is exerted by favoring the growth of those organisms which require its

presence as a condition of life, but that it does not act directly.

If a mass of typhoid bacilli were discharged into a rapid current they might be carried to a greater distance before succumbing in the struggle for existence with other organisms than would have been the case with a slower current. The editor thinks that though much has been learned in regard to these things within the last ten years we are not yet sufficiently well informed concerning them to be justified in saying that a stream that has been polluted by sewage will be a safe source of water supply after it has flowed a stated number of miles, although people all along the Ohio River and the Mississippi use the water for potable purposes—some filtering it to remove the sediment.

So Much for His Looks.

He wouldn't pay his bills, and he imagined that he resembled the lamented Daniel Webster. The former was a fault, the latter an eccentricity and a decidedly weak point with the man.

On his office wall hung a large picture of Daniel Webster, and while the lawyer drew legal documents it was his wont to frequently look at the picture, as if for inspiration, draw a sigh of contentment as he saw the resemblance, and continue with the writing of "the party of the first part" in an action against "the party of the second part."

It was the picture of Daniel Webster that led the lawyer to finally settle an old bill, and unconsciously at that. The creditors were a half-dozen colored people who had at various times cleaned the lawyer's office and tried to arrange his legal papers in a condition bordering on "orderly."

But when they demanded their money the lawyer had the faculty of putting off the payment that was exceedingly discouraging to the creditors. In fact the payment was delayed so long that the claims were finally consolidated and placed in the hands of a collector. The collector was told of the lawyer's weakness and his delight at being told of his resemblance to the picture of Webster suspended on his office wall. On this fact the collector based his hopes of success.

He went to the lawyer's office and while waiting for an audience with the man of legal lore stood gazing at the picture of Webster and then at the lawyer. The latter watched the collector meanwhile from beneath his heavy eyebrows.

"Well, what do you think of it?" queried the lawyer of the collector, glancing at the picture.

"Splendid, splendid!" replied the man with the bill. "You couldn't have a better picture; the artist caught your expression perfectly," and the collector fingered the bill in his pocket.

"Think it looks like me, eh?" "Looks like you—well, it's simply perfect."

"Well, sir, that's a picture of Daniel Webster," and the lawyer heaved with satisfaction and pleasure, and asked what he could do for the visitor. The collector said he wanted to collect twenty dollars and seventy cents, and the lawyer sat down and drew his check. Rising from his seat and handing the check to the collector, the lawyer rubbed his hands together and said, "and so you think Webster looked like me?"

"Oh, yes," replied the collector, as he opened the office door, "about as much as he did like me," and the door went to with a bang.

How He Knew.

Before the fish commissioners of California decided to stock the streams of the State with that much despised but powerful fish, the German carp, they were greatly concerned as to whether it would live in certain waters. The question was debated at several meetings, and was finally submitted to Professor H., an eminent authority.

Samples of the water were obtained and turned over to the professor, who in a short time submitted a favorable report, and the carp were accordingly turned loose in the rivers.

The commissioners were greatly impressed by the professor's knowledge, but one of them had a question to ask. "How could you be sure that carp would live in the water submitted to you?" he inquired.

"Why," answered the professor, with an amused look, "I bought a carp for ten cents and put it into the water. It lived."

Indirect.

In some parts of New England near relatives often treat each other in a manner which is not inaptly parodied by the Boston Globe.

Two brothers who are prominent business men of this city met not long ago in a conventional way, when one of them said to the other:

"You know Miss—?"

"Why, yes; what of that?"

"She's engaged."

"Indeed! to whom?"

"To me."

Evolution.

Who doubts that knowledge—some kinds of knowledge, at least—is largely a matter of intuition?

Little Sarah, 3 years old, came running into the house the other day in a state of great excitement.

"O, mamma," she said, "Mrs. Taylor has killed an old hen to make a chicken of!"

And yet Sarah has never lived in a boarding-house.

Admission.

Abolition plates are sold at some of the house-furnishing shops. They are of use in very hot areas and on very hot stoves to protect the bottoms of looking-glass and mirrors.

of interest in the housing question.

The author's coal bills, which were \$4,000,000, are of great interest.

DRIVING ON ONE WHEEL.

Western Inventor Gailus Comes to the Front with a Novel Sulk.

In order to reduce to the minimum the weight to be drawn by trotting horses, with the possibility of still



ONE-WHEEL VEHICLE.

further lowering the mile record, two Western inventors have designed the novel vehicle shown in the accompanying illustration. In describing it the Philadelphia Record says it possesses but a single wheel, the endless shaft being bent in front to form a raised top portion connected with the saddle girth of the horse. The rear portion of the shaft carries the connections with the wheel, and in addition supports the wheel springs forming the seat of the driver.

An Elephant's Sunshade.

On hot summer days in New York, when the mercury is well up in the nineties, it becomes almost a necessity to carry an umbrella, or shade of some kind, to protect ourselves from the burning rays of the sun. We should hardly expect, however, a native of India—residing in this city—to have the same need for a sunshade, particularly when the native is a huge Indian elephant. That an elephant should feel the heat in our climate seems rather absurd, but as he does, it is quite in keeping with the general intelligence of this animal that he should invent some means of protecting himself from it.

The elephant inclosure in Central Park contains no trees nor shade of any kind, and on those hot days when the heat is almost unbearable, it seems hotter there than any place in New York. Grouped around the inclosure are usually scores of persons, many with sunshades and umbrellas, intently watching the elephants. Some of the huge animals are carefully tossing hay upon their own backs, whilst others, whose backs are almost covered, may be seen peacefully resting. Newly mown grass is what the elephant prefers for this purpose—perhaps because it feels cooler than hay,—but hay answers the purpose very well. How many visitors to the park on those warm days have realized that they were not the only ones carrying sunshades, and that the elephants were protecting themselves in like fashion!

The fact that elephants never attempt to bathe their backs with hay during the winter, although the same opportunities for doing so exist, seems to prove that they use the hay as a protection from heat. They may sportively throw a little hay about, but nothing more. However, in fly-time, there are good and sufficient reasons for the animals adopting the same means of defense again; therefore, when the flies are fierce, the elephants cover their huge backs as on hot summer days.—St. Nicholas.

Effective.

There is a kind of reproof that seems very gentle, and yet cannot be forgotten—like this one, chronicled by the Kennebec Journal.

"A 'section boss' on the Maine Central Railroad was sitting idly by the station when the manager of the line stepped off a train, and asked him if he needed more help. The boss was taken by surprise, but answered promptly that he didn't."

"The manager walked down the track a few rods, picked up two bricks, and removed them to their proper place."

"Every time I have passed here for several weeks," he said to the astonished boss, "I have seen those two bricks lying there, and I thought maybe you hadn't help enough."

"With that he mounted the train and moved off, waving a pleasant good-by to the section crew, who will never, no never, be caught in that way again."

What Is Yours?

Did you ever think of your pet economy? Nearly everyone has one. For instance, there is the man, the very reverse of niggardly, who will race from library to hall and from hall to drawing-room, to get the full value of a sulphur match. A singed finger, or a smudge on the carpet, is a minor matter compared to the major economy of one match to three burners. Then we all know a woman caught in a shower will ruin \$10 worth of feathers rather than indulge in a 50-cent cab. It is these little pin-pick economies which contrast so oddly with lavish expenditures.—Boston Traveller.

Great Scheme.

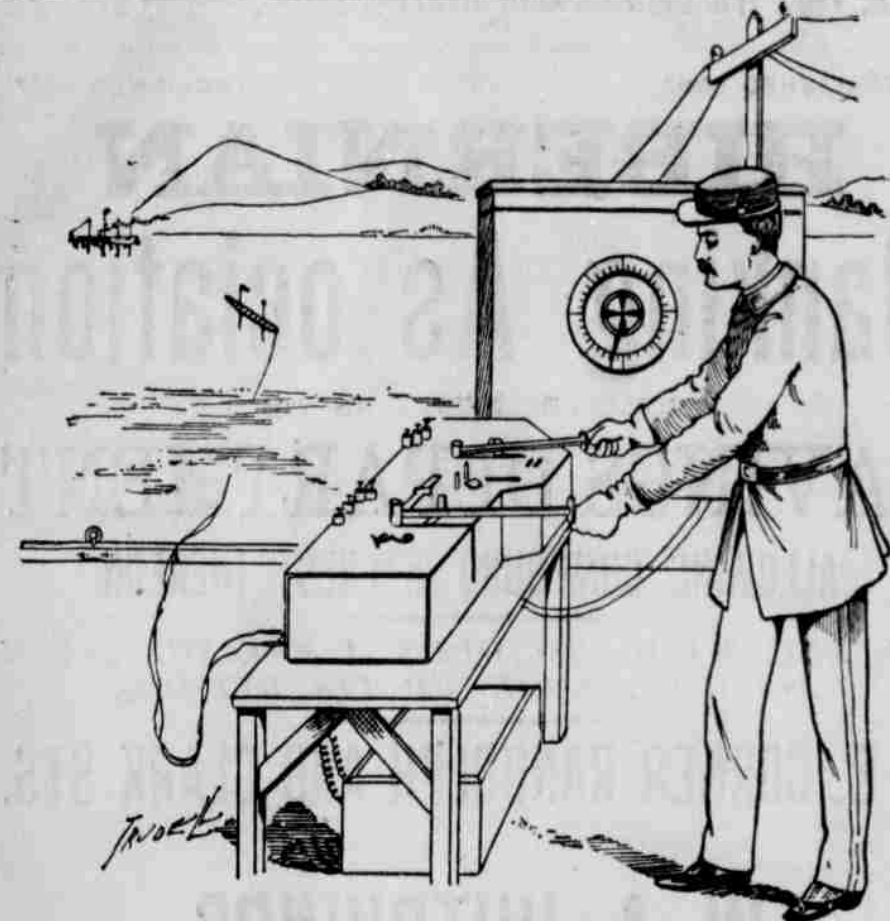
A Roman has offered King Humbert a novel instrument of warfare. This is a projectile which, on being shot from a cannon and striking an object, will produce a luminous disk of 100,000 candle power, and thereby expose to view the enemy's position by night at a distance of from three to four miles.

Don Quixote.

In the 227 years since "Don Quixote" was published, 1,324 editions have been printed, of which 325 were Spanish, 104 English, 178 French, 99 Italian, 54 Portuguese, 43 German, 15 Swedish, 5 Polish, 5 Danish, 4 Russian, 3 Greek, 3 Rumanian, 4 Catalanian, 1 Basque and 1 Latin.

A Good Sign.

A Toronto undertaker recently received a letter from "Mother."



OPERATING THE TORPEDO FROM SHORE.

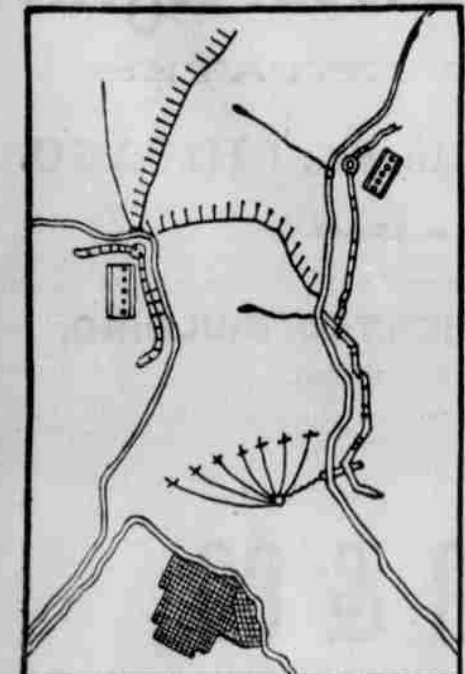
But the first authentic record of the practical efficiency of torpedoes as a recognized means of attack and defense is found in the river and harbor operations during our late civil war, when thirty-seven vessels

adopted spherical case meets all these requirements, and with anchor, wire mooring rope, electric cable and connections constitutes a complete mine ready for action.

From bomb-proof operating casemates seven-colored cables will be laid to junction boxes placed at selected points in the channel. Thence the copper cores will diverge into cables radiating toward the advance, and terminating in three mines, so connected that each will explode singly if struck, while all three can be exploded simultaneously at will. To fill the gaps between the lines, to menace the enemy far in advance of the main defenses, and to compel him to extend countermine operations over a wide area, lines of skirmish or single-cable mines will cut the waters well to the front.

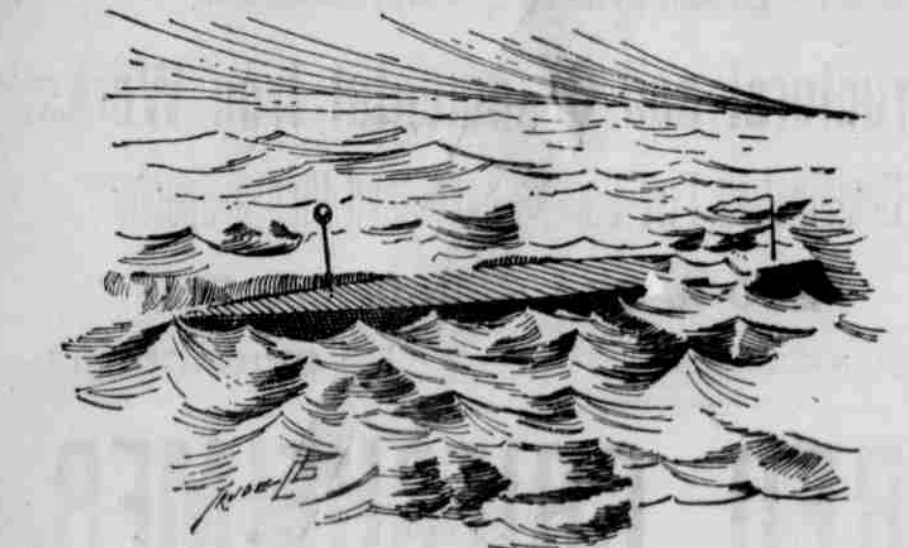
In shallow channels or anchorages on the coast line available for occupation in conducting a distant bombardment large and carefully located ground mines so charged and electrically controlled that their removal by sweeping or grappling would prove both difficult and dangerous will re-enforce the mortar batteries in a very effective manner.

The primary defense of the mines rests with the guns of the batteries commanding the channels, where the main lines will be so arranged as to be swept throughout their length by a flanking fire. The machine and rapid-firing guns, when we have



HARBOR DEFENDED BY SUBMARINE MINES, FLANKING GUNS, AND MORTAR BATTERIES.

were either sunk or seriously damaged by the explosion of heavy gunpowder mines submerged in the approaches to Southern cities. Submarine torpedo boats harassed the fleet blockading Charleston; while the gallant



SIMS-EDISON FISH TORPEDO IN MOTION, NINETEEN MILES AN HOUR.

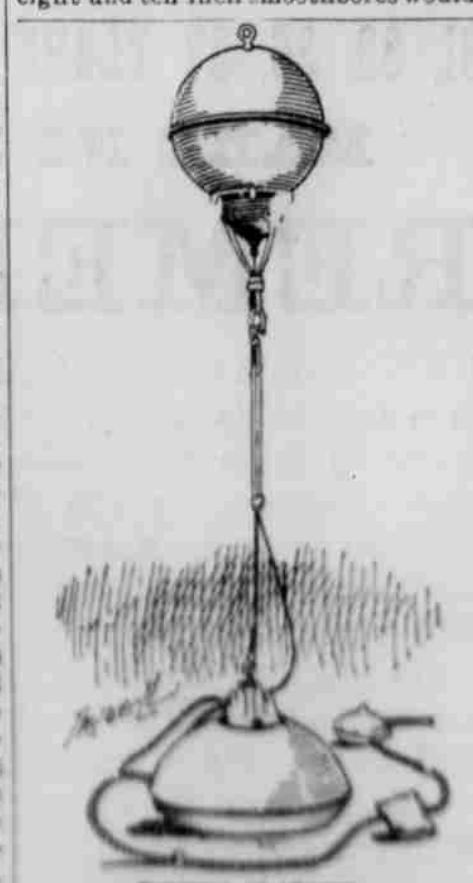
Cushing leaped a small steam launch over a barrier of floating logs and sunk the formidable ironclad Albatross by the explosion of an iron pot full of powder lashed to the end of a spar.

Since that time, stimulated both by the rapid advance in electrical engineering and by the study of high explosives, the development of the torpedo, or sea mine, has been rapidly pushed forward both in this country and in Europe.

In 1869 the Board of Engineers for Fortifications was instructed to experimentally study the general subject of torpedo defense and to prepare detailed plans of applying the approved methods to the several important harbors of the United States. Channels, rivers and anchorages were carefully studied, and elaborate projects for their defense were submitted, comprising plans for bomb-proof electric stations, tunnels to protect the protect the insulated wires, and maps showing the number and proposed location of the mines. And as the handling of high explosives held in leash by the electric current allows no margin for ignorance, carelessness or neglect the establishment of a school of defensive submarine mining was recommended, where enlisted soldiers could receive a thorough training in this special service.

The magnitude of the work outlined can only be appreciated by those who were associated with it. Henry L. Alden, in the development of a practical electric system for managing

them, will play an important part in such operations. But, should war be declared to-morrow, our old-fashioned eight and ten-inch smoothbores would



prove very effective against torpedo boats and launches attempting to work machines under cover of night or a fog. Charged with grape and canister, trained by daylight, and